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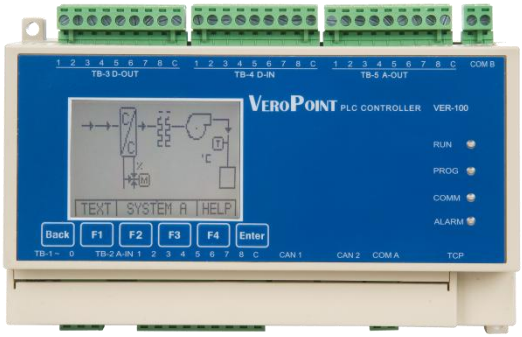

VeroPoint
PLC Controller

Rev1.1

Table of Content

CHAPTER 1 – INTRODUCTION.....*4*

1.1 - About the VeroPoint Controller.....**4**

1.3 — Safety Information.....**8**

1.4 — Warranty.....**9**

1.5 — Your comments are welcome.....**11**

1.6 — Disclaimer.....**12**

CHAPTER 2 — INSTALLATION.....*13*

2.1 — Contents of packaging.....**14**

2.2 — Mechanical mounting.....**15**

2.3 — Wiring Schematics:.....**16**

2.4 — Rear Panel Connections.....**17**

2.5 — Manufacturing Data......**18**

CHAPTER 3 — USING THE SUPERBRAIN.....*19*

CONTROLLER.....*19*

3.1 — Front Panel.....**19**

3.2 — Control Buttons.....**20**

3.3 — Lock Utility.....**20**

CHAPTER 4 — NECESSRY VeroPoint SETTING.....*21*

4.1 — Setting application Programs Error! Bookmark not defined.

4.1.1 — Setting application Programs... Error! Bookmark not defined.

4.1.2 — Selecting Sensors Type..... Error! Bookmark not defined.

4.2 — Wiring & control equipment Check 21

4.3 — Sensors Calibration.. Error! Bookmark not defined.

4.4 — Change language 24

4.5 — Time Settings 24

4.6 — Date Settings.....25

CHAPTER 5 — FRONT PANEL DISPLAYS.....26

5.1 — Graphic Mode Display.....26

5.2 — Text Mode Display.....27

5.3 — Forcing, Manual Operation and Simulation.....28

5.4 — Alarms Display 29

CHAPTER 6 — TIME PROGRAMS 32

6.1 — Choosing Time Program.....32

6.2 — Setting Time Program.....32

6.3 — Setting days in Time Program.....33

CHAPTER 7 — COMMUNICATION.....35

7.1 — Communication settings 35

CHAPTER 8 — Specifications.....39

CHAPTER 1 – **INTRODUCTION**

1.1 - About the VeroPoint Controller

VeroPoint is a stand-alone universal Programmable Logic Controller (PLC), especially designed to control and monitor heating, ventilation and air conditioning systems (HVAC), energy and electrical systems, and automation processes. VeroPoint is the optimal solution for controlling and monitoring public, commercial buildings, hospitals, hotels and industrial buildings. The VeroPoint PLC controller has the capability of functioning as a stand-alone control unit independent of a central computer or clock. Its application programs are stored in FLASH MEMORY and its calendar and clock are backed-up by a battery. The user friendly menus and built-in HMI graphics screen allows adjusting time schedules and monitoring all of the real-time data easily. The CAN-bus communication ports allow increasing the IO points in order to provide optimal and cost effective solution.

An O.E.M. Designed Product:
VeroPoint is especially designed to provide swift, efficient and cost effective solutions, serving the needs of HVAC system manufacturers.
The controller eliminates the need for installation of weekly clock timers, time delay relays, modulating HVAC controllers, indicator lamps and with its build HMI screen can replace a BMS PC station.

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Input/output Points:
The Input/output Points of the base unit of VeroPoint PLC controller are as following:

Input/output Points:
8 Digital Outputs: Dry Contact 150 MA Max
8 Analog Outputs: 0-10 VDC modulating control
8 Universal Inputs: 0-10 VDC or Ni 1000, PT 1000 or dry contact
8 Digital Inputs: dry contact.
The VeroPoint PLC controller is extendible which means it has some additional extension cards to increase the number of the various I/O points. (one base unit can control up to 9 additional cards through CAN bus protocol)
Dimensions:
179 mm x 121 mm x 53 mm
Shipping Weight: 470 Grams
Power Requirements:
Voltage: 24AC +/- 20% or 24VDC
Minimum Transformer Size: 50VA
Frequency: 50/60 Hz
Operation Limits:
Maximum surrounding air temperature: -20°C ÷ 50°C
Humidity: 0-95% RH

Each VeroPoint Controller is carefully and meticulously manufactured using quality components and the latest production methods.

1.2 - How to use this manual

We at CONTROL APPLICATIONS Ltd, envisage this manual to be used by three types of people, i.e. the Installation Technician, the Senior Electrical Engineer and the end User. For this reason this manual is divided into chapters for ease of reference by each of these different people. There could be a situation where two of the abovementioned tasks can be combined, or in a rare instance one person could handle all three tasks.

CHAPTER 1- Introduction, describes the VeroPoint Controller, its potential users, the readings it can provide and some of its features in brief.

CHAPTER 2- Installation, provides detailed instructions for unpacking, mechanical mounting, and electrical wiring up instructions for the Installation Technician.

CHAPTER 3- Using the VeroPoint Controller describes in detail front Panel, the functions of the control buttons, and the Lock Utility.

CHAPTER 4- Parameter Configuration & Settings explains in detail the minimum parameters settings needed by the user to set up and configure the VeroPoint Controller

CHAPTER 5 - Front Panel Displays, is an easy to follow step-by-step guide to obtain data, display graphic screens and tables for the User.

CHAPTER 6 - Time tables gives details about the weekly timetables and how to set them up.

CHAPTER 7 - Communications gives details about the Communication capabilities of the VeroPoint Controller, and how to set up.

CHAPTER 8 - Specifications is a detailed list of specifications of the VeroPoint Controller.

1.3 — Safety Information

The purpose of this manual is to help you. Please read the instructions carefully before performing any installation and note any precautions.

WARNING!

- Ensure that all incoming power and other power sources are turned off before performing any work on the VeroPoint Controller. Failure to do so may result in serious or even fatal injury and/or equipment damage.
- If the VeroPoint Controller is damaged in any way do NOT connect it to any power source.
- To prevent a potential fire or shock hazard, never expose the VeroPoint Controller to rain or moisture.
- Keep the surrounding area free of dirt and clutter especially metal objects. Good housekeeping pays.
- Inspect the cables periodically for cracks, kinks or any other signs of wear
- Keep children away.
- Do not pull the cords.

- Users should stay alert and not approach the rear of the VeroPoint Controller while tired or under the influence of alcohol, medicines or any other chemical substance that would tend to make a person drowsy.

- Do not wear loose clothing or dangling jewelry.
- Above all use common sense at all times.

1.4 — Warranty

CONTROL APPLICATIONS Ltd provides a 12- Month warranty against faulty workmanship or components from date of dispatch provided that the product was properly installed and used.

CONTROL APPLICATIONS Ltd does not accept liability for any damage that may be caused by natural disasters (such as floods, fire, earthquake, lightening etc.).

CONTROL APPLICATIONS Ltd does not accept liability for any damage that may be caused by malfunction of the VeroPoint Controller.

CONTROL APPLICATIONS Ltd will advise the customer on the proper installation and use of the VeroPoint Controller, but will not accept any responsibility that the instrument is suitable for the application for which it was originally purchased.

This warranty may become void if the Installation, Parameter Configuration & Setting Instructions are not carried out according to the instructions set out by CONTROL APPLICATIONS Ltd.

The VeroPoint Controller has no user serviceable parts and should be opened and serviced by a duly qualified authorized representative only. The sensitive electronics could become damaged if exposed to a static environment. This action would void the warranty.

This warranty is limited to the repair and/or replacement at CONTROL APPLICATION Ltd sole discretion of the defective product during the warranty period. Repaired or replaced products are warranted for ninety (90) days from the date of repair or replacement, or for the remainder of the original product's warranty period, whichever is longer.

CONTROL APPLICATIONS Ltd is always at your service to advise the customer on any problem that may be encountered regarding any installation, operation, parameter & configuration settings or maintenance.

1.5 — Your comments are welcome

CONTROL APPLICATIONS Ltd. Sincerely thank you for choosing our VeroPoint Controller. We are confident that it will provide you with many years of trouble free service and give you the best controlling performance that you expected from the instrument when you bought it.

While every effort was made to keep the information as reliable, helpful, accurate and up to date as possible, all possible contingencies cannot be covered. Technical or typographical errors could occur, and we would be happy to receive any comments, criticisms or notifications of any such errors from you, our valued customer.

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Electronic Address:	cal@ddc.co.il

1.6 — Disclaimer

Information in this User Manual is subject to change without notice and does not represent a commitment on the part of CONTROL APPLICATIONS Ltd.

CONTROL APPLICATIONS Ltd supplies this User Manual as is without warranty of any kind, either expressed or implied, and reserves the right to make improvements and/or changes in the manual or the product at any time.

While it is the intension of CONTROL APPLICATIONS Ltd to supply the customer with accurate and reliable information in this User Manual, CONTROL APPLICATIONS Ltd assumes no responsibility for its use, or for any infringement of rights of the fourth parties, which may result from its use.

This User Manual could contain technical or typographical errors and changes are periodically made to the information herein, these changes may be incorporated in new editions of the publication.

CHAPTER 2 — **INSTALLATION**

In this Chapter you will find the information and instructions that the Installation Technician needs to mount and connect the VeroPoint Controller

WARNING!

- During operation, hazardous voltages are present in connecting cables and terminal blocks.
- Fully qualified personnel must do all work. Failure to follow this rule may result in serious or even fatal injury to personnel and/or damage to equipment.
- Refer to Section 1.3 Safety information before carrying out any installation.
- Read this manual thoroughly and make sure you understand the contents before connecting the VeroPoint Controller to any power source.
- Always install an external fuse rated 2A in the power input circuit.

2.1 — Contents of packaging

To unpack the VeroPoint Controller:

The VeroPoint Controller is packed and shipped in a carton approximately 24.5 cm long X 19 cm wide X 12 and cm high.

Before opening the package, ensure the area, clean and dry. Without using any sharp instruments, carefully open the carton of the VeroPoint Controller.

Please check the contents of the carton, it should contain:

1. Your new VeroPoint Controller.
2. VeroPoint User Manual (this book).
3. 4 X nine pole connector plugs for IO.
4. 1 X three pole connector plug for power supply.
5. 2 X two pole connector plug for communication.

2.2 — Mechanical mounting

To Mount the VeroPoint Controller

Do not mount the VeroPoint Controller too close to any main electrical conductors

1. Choose a suitable on a Din Rail, and mount the VeroPoint as shown in Figure 2.1

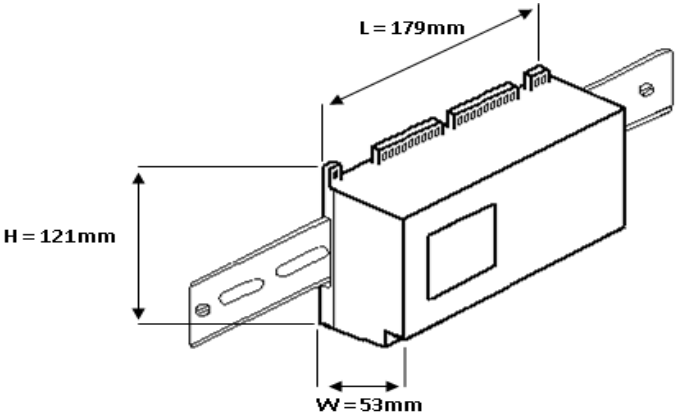

Figure 2-1. **Din Rail Installation Dimensions**

2.3 — Wiring Schematics:

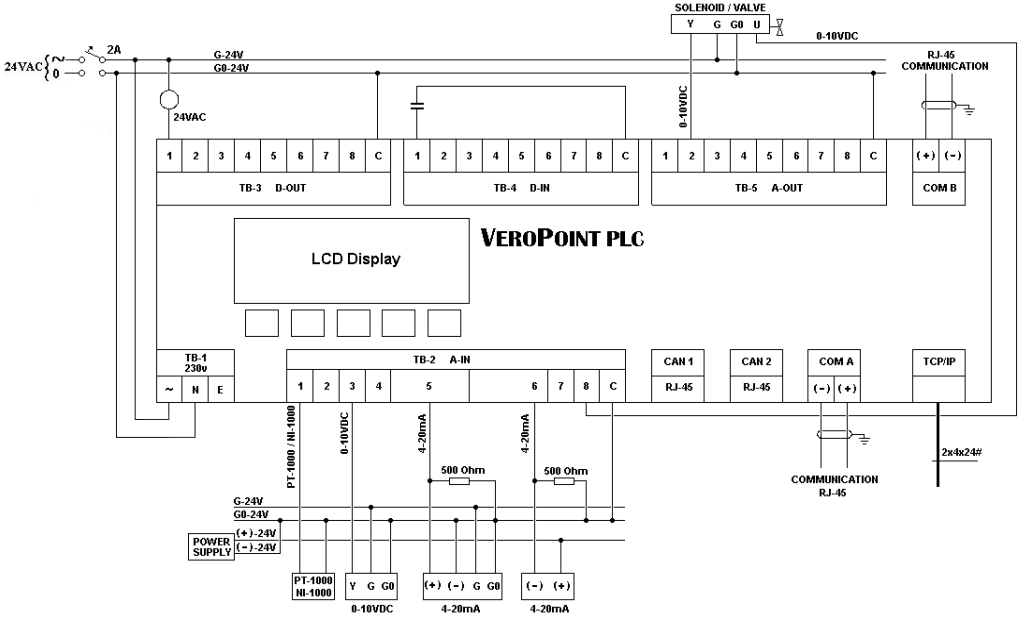

Figure 2-2. **Wiring Diagram**

2.4 — Front Panel Connections

Please re-read section 1.3 for safety instructions.

Pin Designation	Description	Remarks
L	24V AC supply voltage	Through a 2 Amp fuse
N	24V AC supply voltage	Ground
D-OUT C, 1-8	Eight digital outputs	Dry contact maximum current 150mA
D-IN C, 1-8	Eight digital inputs	
A-OUT C, 1-8	Eight analog outputs	
A-IN C, 1-8	Eight universal inputs	
COMM A -	RS485 Comm. (-) Line for com A	
COMM A +	RS485 Comm. (+) Line for com A	
COMM B -	RS485 Comm. (-) Line for com B	
COMM B +	RS485 Comm. (+) Line for com B	
CAN 1	High speed Canbus for extension cards	
CAN 2	Canbus port	
TCP	Ethernet port	

Table 2-1 Front Panel connections

2.5 — Manufacturing Data.

1. On the Main menu press F1 on the keyboard for 6 seconds. The following screen will appear.

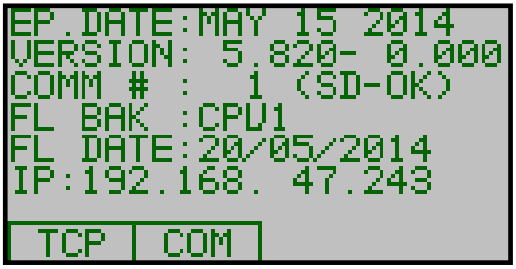

Figure 2-3. **Manufacturing Data**

Number	Screen	Description
1	Ep. Date	Production date of software operating system
2	Version	Program version no.
3	Comm #	Address of MODBUS Protocol
4	FL BAK	Compiled program file name
5	FL DATE	Compile Date
6	IP	IP address

Table 2-2 **Manufacturing Data**

CHAPTER 3 — USING THE VEROPOINT CONTROLLER

In this chapter you will find descriptions and functions of the front, control buttons and how to use them.

3.1 — Front Panel

To operate the front panel:

The Front Panel has a graphic screen and 6 operating buttons.

All the readings are shown on a state of the art 128X 64 resolution graphic screen and are explained in detail in Chapter 5.

The Control Buttons and their functions are fully explained in Section 3-2.

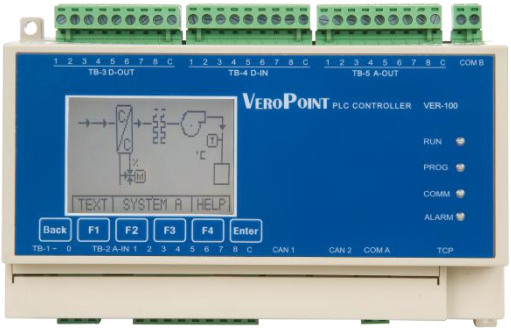

Figure 3-1. **Front Panel**

3.2 — Control Buttons

To operate the Control Buttons on Front Panel:

The VeroPoint Controller has six Control Buttons. With these buttons the User can achieve all the functions necessary.

The Control Buttons are arranged on a keypad below the display screen and require slight finger pressure to click.

Enter – Operates the selected function.

Back – Return to previous menu.

F1-F4 – Perform the functions indicated of the LCD display above each button. For example, in figure 3-1, F1 performs change to TEXT mode display.

3.3 — Lock Utility

The Control Buttons can be locked against any unauthorized or accidental usage.

NOTE: Only sub menus can be locked. The Lock Utility does not work on the Main Menu

To **Lock** press Enter for six (6) seconds.

A "Keyboard Locked!" message appears on the screen when any button is pressed.

To **Unlock** simply press Enter for six (6) seconds.
A "Keyboard Unlocked!" message appears on the screen and normal functions can resume.

In the event of a general power failure, the VeroPoint Controller will return to the last screen showed before the power failure occurred.

CHAPTER 4 — **NECESSRY VeroPoint SETTING**

In this chapter you will find instructions to set the minimum settings that are necessary to allow the VeroPoint Controller to function properly.

4.1 — Wiring & control equipment Check

To avoid system malfunctions as a result of incorrect wiring or control equipment malfunction, VeroPoint controller allow you to check the input and the outputs in a very friendly way. All inputs are displayed on the LCD screen. All outputs can be forced to any value for control equipment checkup and all Input values can be forced to any value in order to check the controller operation.

To perform Wiring & control equipment Check:

From the Main Menu access the Setup, the "System Setup" screen will appear.

1. Scroll to CHECK WIRING and press "Enter".
2. Use F1, F2 to choose the require I/O type to check:

- Analog Inputs
- Analog Outputs
- Digital Inputs
- Digital Outputs

3. The relevant IO list screen will appear.

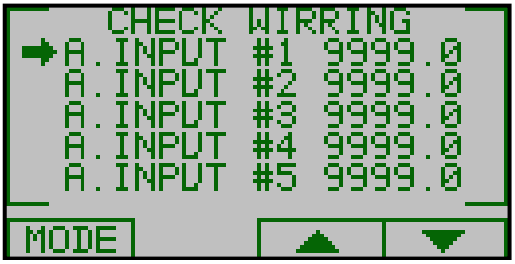

Figure 4-6. **IO List**

4. In case forcing (overriding) is required – scroll to desirable IO point and press "Enter". The change value screen will appear.

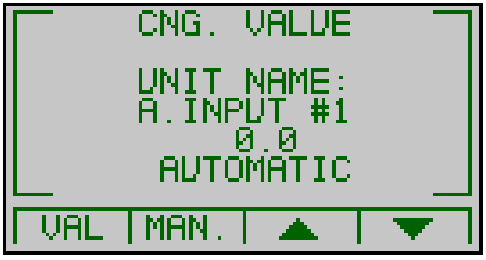

Figure 4-7. **Change Value**

5. At the default mode the IO point appears as "Automatic" and shows its real time value\status, in order to force the IO point press on F1 – "VAL".

6. The Enter New Value screen will appear.

Figure 4-8. **Enter New Value**

7. Use the F1, F2 buttons to change the value and F3, & F4 buttons to move left and right, when finished press "Enter".

Chapter 4.1 above allows forcing one or more Inputs and/or Outputs. In case of forcing I/O points the controller stops controlling the forced output and relate to forced input as a real input reading.

User must return all forced I/O to AUTO mode by accessing the Change Value screen (Figure 4-7) and click F2 - Auto!

4.2 — Change language

The “Change Language Utility” works on the Main screen only:

1. Click F2 for 6 seconds. The language menu will appear.
2. Scroll to desirable language and press "Enter".

Figure 4-16. **Set Language**

4.3 — Time Settings

To set Time:

1. See Section 4-1 for instructions to arrive at the System Setup.
2. From the System Setup scroll to SET TIME and press "Enter" key. The Set Time screen will appear.

Figure 4-16. **Set Time**

3. Use F3, F4 (< >) to select digits and F1, F2 (- +) to change digits in order to set the time: [HH:MM:SS].

4.4 — Date Settings

1. To set Date See Section 4-1 for instructions to arrive at the System Setup.
2. From the System Setup scroll to SET DATE and press Enter key. The Set Date screen will appear.

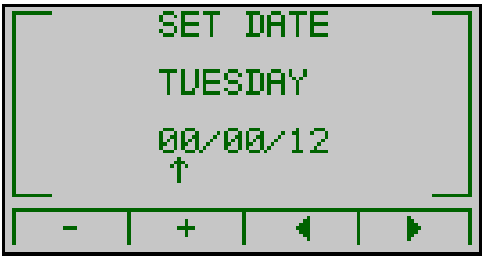

Figure 4-17. **Set Date**

3. Use F3, F4 (< >) to select digits and F1, F2 (- +) to change digits in order to set the date: [DD/MM/YY].

CHAPTER 5 — **FRONT PANEL DISPLAYS**

In this chapter you will find instructions on how to obtain the readings that the VeroPoint Controller provides and options to activate control elements.

5.1 — Graphic Mode Display

From the main menu, figure 5-1, use F3, F4 to select “DISPLAY DATA” and press "Enter" key.

If no program was sent to the controller, no data will be displayed, figure 5-1.

If a program was sent to the controller, the data will appear on the display, figure 5-2.

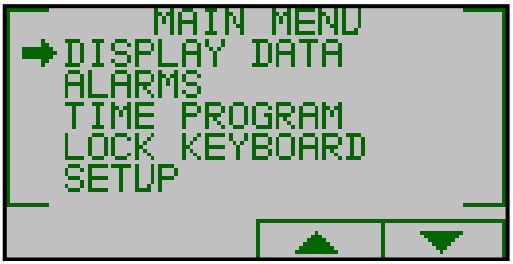

Figure 5-1 **Graphic Display**.

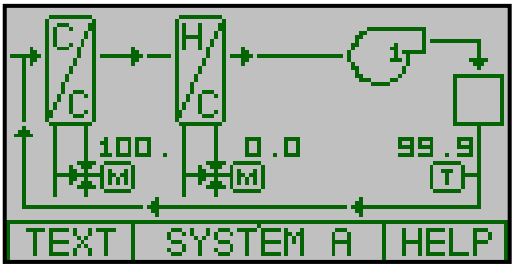

Figure 5-2 **Graphic Display**.

1. Use F4, “HELP”, to see more details about the program currently working on the controller.
2. Use F1 to change display to TEXT mode.

5.2 — Text Mode Display

1. Follow the instructions in chapter 5.1 and enter text mode.
2. All the input, outputs and parameters will be displayed.

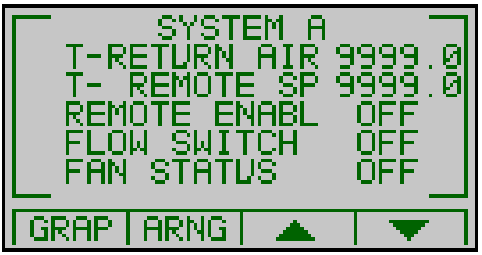

Figure 5-3. **Text Display**

3. Pressing on F1, "GRAP" will bring you back to the graphical screen.
4. Pressing F2, “ARNG” for 3 seconds – arranges the order of the data, by locating the selected data at the top of the list.
5. Press F3, F4 to scroll between the data.

5.3 — Forcing, Manual Operation and Simulation

1. Press F1 to change display to text mode.
2. Use F3, F4 (up / down) to select the I/O or parameter to be monitored and press "Enter".
3. A requirement – "Enter Technical Code" will appear. Insert the password.
4. Choosing a digital input or digital output will allow setting the value ON (F4) or OFF (F3) and toggle Manual / Automatic mode (F2). See the following screen:

Figure 5-4 **Manual Value to Digital Point**.

5. Choosing an analog input, analog output or a parameter will allow: **setting the value** - VAL F1, or **increasing the value** - F3, **decreasing the value** - F4 and **toggle Manual/Automatic mode** - F2. See figure 5-5.

Figure 5-5 **Manual Value to Analog Point**.

6. In order to insert an immediate value press F1-“VAL".

Figure 5-6. **Immediate Value to Analog Point**

WARNING

Chapter 4.1 above allows forcing one or more Inputs and/or Outputs. In case of forcing a control I/O the controller stops controlling a forced output and not reading a forced input.

User must return all I/O to AUTO status!

5.4 — Alarms Display

To see the status for the alarms in the System and the Historical Alarms list:

1. From the Main Menu, scroll to “ALARMS” and press "Enter".
2. The Alarms screen will appear.

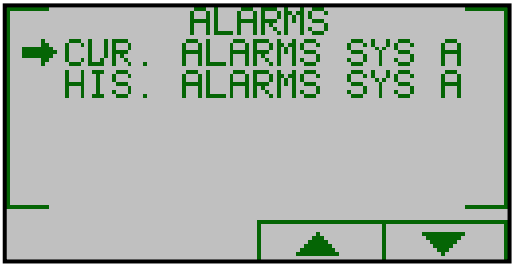

Figure 5-6. **Alarms Screen**

3. Use F3 and F4 to scroll to the desirable Current or Historical Alarms display and press "Enter".

4. Historical Alarms - up to 100 Historical Alarms are stored in the memory, once the Historical Alarms number reaching 100 the oldest one will be erased by FIFO method (first in first out).

5. **Alarm pop up** – once the alarm accrues, an alarm signal will pop up and blink on the display.

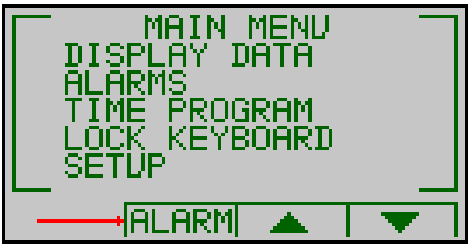

Figure 5-7. **Alarm Blinks on Main Menu**

Pressing F2 will detail the alarms in the system. The number in brackets is the quantity of existing current alarms in the system.

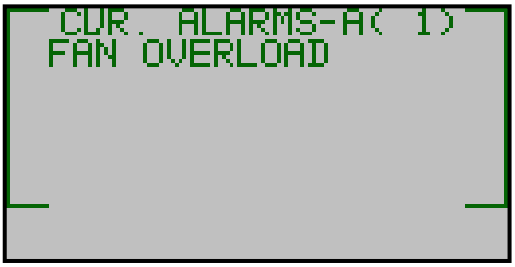

Figure 5-8. **Alarm Details**

CHAPTER 6 — TIME PROGRAMS

In VeroPoint controller there are 8 weekly time programs numbered 1up to 8. The time programs can be assigned to any output in programming.

6.1 — Choosing Time Program

1. From the Main menu, scroll to “TIME PROGRAM” and press "Enter".
2. The Time Program screen will appear.

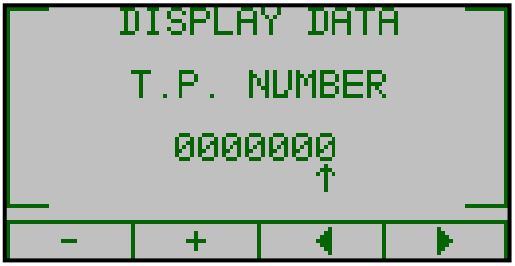

Figure 6-1. **Choosing Time Program**

Use **F1, F2, F3, F4** to choose the time program number (1-8) (To assign a time program to any output refer to the VeroPoint Programming manual).

Press **Enter** to enter the chosen time program settings.

6.2 — Setting Time Program

Follow the instructions in chapter 6.1 to choose the time program number required for setting. Notice: this time program may activate more than one output.

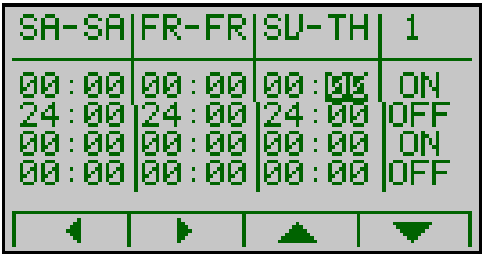

Figure 6-2. **Setting Time Program #1**

In figure 6-2, operating times and days can be set by locating the marker to the appropriate field, using the arrows (keys F1-F4), and pressing Enter key. F3 and F4 keys will allow decreasing or increasing the values at the marker location. See figure 6-3.

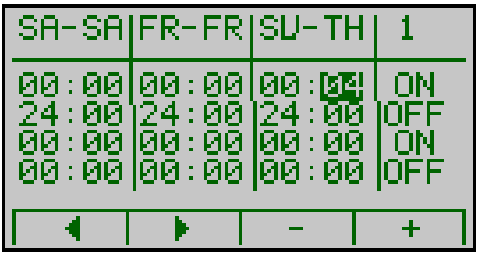

Figure 6-3. **Setting Values in Time Program #1**

Pressing Enter in figure 6-3 will return to figure 6-2, allowing selecting other values to change.

6.3 — Setting days in Time Program

The time program table includes 3 columns: Sunday-Thursday, Friday and Saturday. User can change the days for the columns. For example, Monday, Friday, Saturday and Sunday. If a certain day were not included in the time-table, it means that in this day the output will not operate.

To change the days, locate the marker in figure 6-2 to one of the days at the top of the columns and press Enter key. Figure 6-4 will appear.

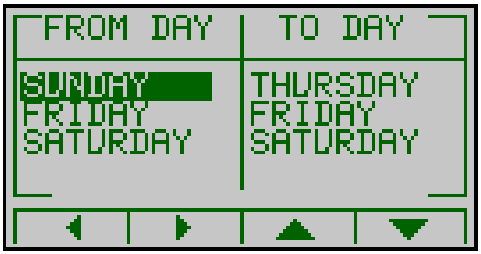

Figure 6-4. **Setting Days in Time Program**

The first row in figure 6-4 refers to the first column in figure 6-2.The second row in figure 6-4 refers to the second column in figure 6-2. The third row in figure 6-4 refers to the third column in figure 6-2. In order to change the data, choose the required row with the arrows (F1-F4). Press Enter key. F3, F4 key will change to -/+. Change the days with F3, F4 and press Enter to return to figure 6-4.

WARNING!

Chapter 6 describes the method to change and set Time Program #1. The User must consider that this time program may be operating other outputs. If so, changing this time program will affect all outputs related to this time program. If this in not wanted, use other time program than #1 to the other outputs.

CHAPTER 7 — COMMUNICATION

MODBUS Protocol

The VeroPoint Controller has an RS485 interface allowing direct interface with an external communication network supporting the MODBUS and Bacnet MSTP protocols. (Ethernet TCP IP port optional – supprots ModBus and Bacnet IP).

Technical data can be found in the technical document: “VeroPoint Communication”

7.1 — Communication settings:

To enable the User to connect the VeroPoint Controller to a PC master computer or controller, for successful communications, the Communication Setup parameters of both must match; i.e. the port of the PC/controller master and the configuration settings of the VeroPoint.

Parameters of communication:

Address from 1-255
Baud Rate from 300 to 115200 bps.
Parity: odd/even/none

7.2 — Serial Communicatin:

1. See Section 4-1 for instructions to arrive at the System Setup.
2. From System Setup scroll to Communication Settings and press "Enter".

Figure 7-1. **Serial Communication Setup**

3. Use F1, F2 keys to change the values at the marker location.
4. F3, F4 keys are used for selecting the required parameter: address, Baud Rate and parity.

a. — To set up Ethernet communication:

1. See Section 4-1 for instructions to arrive at the System Setup.
2. From System Setup scroll to Communication Settings and press "Enter".
3. The Communication Setup screen will appear. Scroll to "Ethernet" menu and press "Enter".
4. The Ethernet screen will appear.

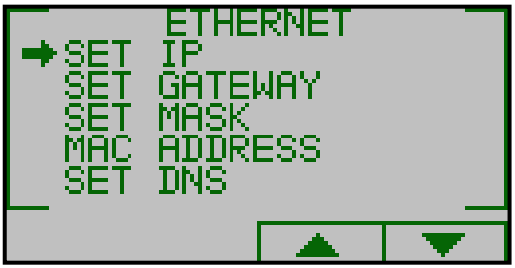

Figure 7-2. **Ethernet Communication Setup**

5. Scroll between the menus and define the required Ethernet definitions according to the local network address and requirements.

6. To set IP address scroll to SET IP and press "Enter". The Set IP screen will appear.

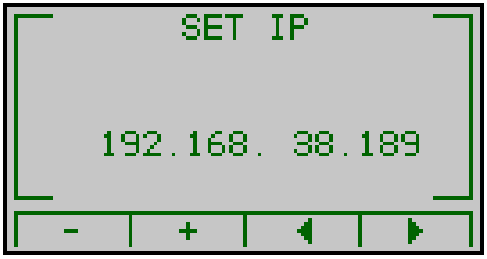

Figure 7-3. **Set IP Address**

7. Use F3, F4 (< >) to select digits and F1, F2 (- +) to change digits in order to set the IP. When finished press "Enter".

8. Repeat steps 6 and 7 to set the Gate Way and MASK (if required).

9. The MAC address always adjusts itself automatically according to the unique IP address of the device. However it can be changed as well by repeating steps 6,7.

b. — BACnet Definition:

1. See Section 4-1 for instructions to arrive at the System Setup.
2. From System Setup scroll to BACnet definition and press "Enter".
3. The BAC definition screen will appear.

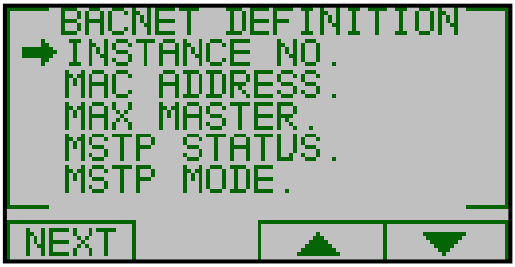

Figure 7-4. **BACnet Definition screen**

4. To set up Instance number, choose it from the menu And press "Enter".
5. The INSTANCE NUMBER screen will appear.

Figure 7-5. **BACnet MS/TP screen**

6. Use F3, F4 (< >) to select digits and F1, F2 (- +) to change digits in order to set the INSTANCE NUM. When finished press "Enter".
7. Repeat steps 4 and 6 to set the MAC ADDRESS, MAX MASTER, MSTP STATUS, and MSTP MODE, BBMD TIME, BBMD PORT, BBMD IP (if required).

CHAPTER 8 — **Specifications**

Item	Description
Power requirements	24AC +/- 20% or 24VDC
Dimensions	(HxWxD) 121x179x53 mm
Shipping Weight	500 gr.
Enclosure material	ABS + Antiflame
Display	Graphic 128x64
Maximum surrounding air temperature:	-20°C ÷ 50°C
Storage temperature	-20 - + 80 C
Humidity	0- 90 RH%
Voltage input terminals	VL – E10 1708
Communication port	RS485, Ethernet
Mounting	Din Rail Mounting

All technical specifications are subject to change without notice.